

Vol. 7.

MAY, 1920

No. 5.

JOURNAL
OF THE
BOSTON SOCIETY
OF
CIVIL ENGINEERS



Published monthly, excepting July and August, by the Society,
715 Tremont Temple, Boston, Massachusetts.

Entered as second-class matter, January 15, 1914, at the Post Office at Boston, Mass.,
under Act of August 24, 1912.

Acceptance for mailing at special rate of postage provided for in Section 1103, Act of
October 3, 1917, authorized on July 16, 1918.

Subscription Price, \$4.00 a year (Ten Numbers)
50 Cents a Copy

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BOSTON SOCIETY OF CIVIL ENGINEERS
FOUNDED 1848

PROCEEDINGS

PAPERS IN THIS NUMBER.

Address at the Annual Meeting. Leonard Metcalf.

Discussion of Small Sewage Pumping Stations. Thorndike Saville.

Memoir of Deceased Member.

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MINUTES OF MEETINGS.

BOSTON, April 21, 1920. — A regular meeting of the Boston Society of Civil Engineers was held this evening at Chipman Hall, Tremont Temple, and was called to order at eight o'clock by the President, Frank A. Barbour.

There were 78 members and visitors present.

The record of the annual meeting of March 17 was read and approved.

The Secretary reported for the Board of Government the election of the following candidates to membership in the Society in the grades named:

Members — Messrs. Albert W. Badger, George S. Coleman, John E. Connor, Richard H. Ellis, Charles E. K. Fraser, George F. Haskell, William V. P. Hoar, Frank O. Holmes, Daniel J. Lynch, Walter A. Maloy, J. Wendell Moulton, Daniel A. Murphy, Clarence G. Norris, Edwin S. Parker, Herbert L.

Paterson, Waldo F. Pike, Mark E. Pitman, Henry A. Sherman, Edward L. Walker and Ernest M. Young.

Junior — Mr. Kenneth C. Reynolds.

The Secretary also announced the appointment by the Board of Government of the following committees of the Society:

On the Library — S. Everett Tinkham, chairman; Howard B. Luther and Edward H. Rockwell.

On Publication — Sturgis H. Thorndike, chairman; Harold K. Barrows and Henry B. Wood.

On Run-Off Available for Water-Power Purposes — Arthur T. Safford, chairman; H. S. Boardman, A. C. Eaton, X. H. Goodnough, R. A. Hale, C. H. Pierce, W. H. Sawyer, C. W. Sherman, W. F. Uhl, F. E. Winsor and D. M. Wood.

On Membership — Frank B. Walker, chairman; John B. Babcock, 3d; John E. L. Monaghan, Samuel P. Waldron and John P. Wentworth.

On Social Activities — Charles R. Berry, chairman; Armand W. Benoit, Harrison P. Eddy, Jr.; Ralph W. Horne, Waldo F. Pike and Howard C. Thomas.

On Papers and Program — Frank A. Barbour, chairman; Gordon M. Fair, Frank A. Marston, George E. Russell, George A. Sampson, Sanford E. Thompson, S. Everett Tinkham and Leonard C. Wason.

On Legislative Matters — Richard A. Hale, chairman; Charles B. Breed, Edwin H. Rogers, Hartley L. White, Frank O. Whitney.

On Welfare — Charles R. Gow, chairman; Charles R. Berry, Beardsley Lawrence, Frank A. McInnes, Leonard Metcalf, Reeves J. Newsom and John F. Osborn.

On Compensation of Engineers — Charles R. Gow, chairman; Frank A. Barbour, Henry F. Bryant, Walter W. Clifford, Luzerne S. Cowles, Charles E. Nichols, Barzillai A. Rich, Charles M. Spofford and John P. Wentworth.

The President, in a brief address, called attention to the appointment of a committee on membership which would, he hoped, enter upon a vigorous campaign and raise the total membership of the Society above the one-thousand mark. He asked for the earnest coöperation of the members in this work, and promised the committee the full support of the Board of Government.

The President announced that the board had, in answer to the petition of about twenty members, established a new

section of the Society, to be known as the "Designers' Section." A preliminary meeting has already been held, and at the next meeting, called for April 28, a code of by-laws would be adopted and officers elected as provided for in the By-Laws of the Society.

The Secretary presented a memoir of John S. Humphrey, a member of the Society, who died February 5, 1919, prepared by a committee consisting of Messrs. Charles B. Humphrey and Frank O. Whitney. The memoir was accepted and ordered printed in the JOURNAL.

Mr. John C. Chase suggested that the announcement of the death of Miss Evans, the Assistant Librarian of the Society, which appeared in the notice of this meeting, be made a part of its record, and it was so ordered by the President:

“Members of the Society, especially those who have used its rooms in recent years, will learn with sincere regret of the death of Miss Mary E. Evans, the efficient assistant to the Secretary and Assistant Librarian, which occurred April 8, 1920.

“Miss Evans has been in charge of the Society's Library for the past seven years, and during that time has re-arranged and re-catalogued the larger portion of it in a most satisfactory manner.

“By her pleasing personality, her helpfulness to all who had occasion to visit our rooms, and her unfailing courtesy at all times, she has left a gracious memory which will be long cherished by our members.

“The Secretary wishes to place on record his deep personal appreciation of the invaluable assistant she has been to him during all these years, and of the loyal and conscientious manner in which she performed her work.”

The President then called on the speaker of the evening, Past-President James W. Rollins, to present his paper entitled, "Construction of Masonry Piers and abutments of the Thames River Bridge at New London, Conn." The paper was fully illustrated with lantern slides, and proved most interesting.

A brief discussion followed, by members of the Society and by Clarence Blakeslee, member of the American Society of Civil Engineers.

At 9.30 o'clock the meeting adjourned.

S. E. TINKHAM, *Secretary.*

BOSTON, May 19, 1920. — A regular meeting of the Boston Society of Civil Engineers was held this evening at Chipman Hall, Tremont Temple, and was called to order at 7.55 o'clock by the President, Frank A. Barbour.

There were 85 members and visitors present.

The record of the last meeting was read and approved.

The Secretary reported for the Board of Government the election of the following candidates to membership in the grade of member:

Messrs. Edward H. Cameron, George W. Dakin, Francis J. Gateley, William E. Hannan, William R. Holway, William A. Johnson, Arthur J. Lennon, George P. Longfellow, Lawrence J. Monahan and James P. O'Connell.

The President announced the death of Loammi F. Baldwin, a member of the Society, who died May 9, 1920. By vote the President was requested to appoint a committee to prepare a memoir of Mr. Baldwin.

The committee appointed consists of Messrs. Richard A. Hale and James R. Baldwin.

The Secretary, for Mr. John C. Chase, presented the report of the committee appointed to prepare a memoir of Frank L. Fuller, and by vote the report was accepted and ordered printed in the JOURNAL of the Society.

The President presented and read the report of the Committee on Compensation of Engineers, which is appended hereto.

After some discussion, on motion of Mr. Whitney it was voted —

That the report be received and the committee discharged, and that the recommendations in the report be submitted to the Society for a letter ballot.

The President stated that the Board of Government had received a letter from Mr. Charles W. Sherman suggesting that a committee of the Society be appointed to consider the advisability of petitioning the legislature at its next session for the passage of an engineers' license law in this state. Mr. Sherman said, further, that the state of New York had just passed such

a law, and this matter of licensing engineers seemed to be spreading rapidly over the country, and in order to enjoy the reciprocal relations which many of these laws provide, it would seem to be necessary, as a matter of self-defense, we should have similar licenses in Massachusetts. The President stated that the Board of Government recommended the appointment of such a committee. On motion of Professor Spofford, it was voted —

That the President be authorized to appoint a committee of five to consider the advisability of securing the passage of a law licensing engineers at the next session of the legislature, and if they deemed such a law desirable, to draft such a proposed law and submit it with their report.

The President has named as the committee Messrs. Charles W. Sherman, Charles T. Main, Irving E. Moulthrop, Edwin H. Rogers.

It was voted to hold the next meeting of the Society on June 9, 1920, in connection with the joint outing of this Society and the New England Water Works Association.

By vote the President and Treasurer were authorized to execute a lease on behalf of the Society with the Tremont Temple Baptist Church, for the term of three years, and also to execute leases with the sub-tenants of the Society.

The President then introduced the speaker of the evening, Prof. George W. Pierce, of Harvard University, who addressed the Society most interestingly on the subject of "Submarine Detection and Acoustical Aids to Navigation." The address was illustrated with lantern slides.

At the conclusion of the address, Professor Pierce answered freely many questions of the members.

Before adjourning, a rising vote of thanks was tendered Professor Pierce.

Adjourned.

S. E. TINKHAM, *Secretary.*

BOSTON SOCIETY OF CIVIL ENGINEERS.

REPORT OF COMMITTEE ON COMPENSATION OF ENGINEERS.

BOSTON, APRIL 26, 1920.

*To the President and Members of the**Boston Society of Civil Engineers:*

On July 3, 1919, the Board of Government of the Boston Society of Civil Engineers, through its president, appointed a committee to investigate and report to the Board its conclusions respecting the subject of Compensation of Engineers. Under date of February 2, 1920, the committee submitted to the Board of Government an analysis of its investigations and conclusions, together with some suggestions of possible action by the Society. This report was submitted by the Board of Government to the membership for information and criticism, and was further discussed at a special meeting held February 25 at the Society's rooms.

As a result of this discussion it was voted that the matter be referred back to the committee for further consideration. In addition, the following motion was adopted:

"That this meeting commend to the favorable consideration of the Committee on Compensation of Engineers the suggestions that —

"(a) Government, state and municipal engineering service should command compensation measurably greater than the equivalent service rendered to other parties.

"(b) There should be a substantial vertical rise from the upper limit of one grade to the lower limit of the next higher grade.

"(c) An effort should be made to formulate and secure governmental, state and municipal adoption of a plan for the automatic increase in compensation, within each grade of service and between the limits fixed, said increase to be dependent upon and in a measure commensurate with the length of the term of service.

"(d) The schedule of salaries advocated by the Engineering Council is reasonable, just to employer and employee, and should be endorsed by the Society, and such endorsement I believe requires certain formalities.

"(e) In cases where the public authorities are unwilling to grant increases in compensation sufficient to provide salaries equal to the schedule of Engineering Council, this Society should approve an increase equivalent to about 40 per cent. in all grades of service — with the distinct understanding that such increase is to constitute simply a first step, and that further increase should be forthcoming from year to year as rapidly as possible until the schedule of Engineering Council shall have been put into effect."

In accordance with these instructions your committee has given further consideration to the question involved, and especially to the recommendations outlined in the above vote, and has reached the following conclusions:

(a) The committee does not feel warranted in recommending that government, state and municipal engineering service should command compensation measurably greater than equivalent service rendered to other parties. The committee is strongly of the opinion that engineering service is entitled to equal compensation whether publicly or privately rendered.

(b) In view of the action of the committee with respect to suggestion (d), which is discussed further on, no special action is required on this suggestion.

(c) While recognizing many of the practical difficulties which will be

encountered, the committee is of the opinion that there will be some merit in the adoption of a plan for the automatic increase in compensation within each grade of service, and commensurate also with the length of service. It seems to the members of the committee, however, that this is a matter which may well be referred to the permanent Committee on Welfare, for its future consideration.

(d) The committee feels that the schedule of salaries advocated by Engineering Council is reasonable, just to employer and employee, and that it should be endorsed by the Society. It is felt that any action looking to improvement in the compensation now paid to engineers can best be prosecuted when approached with a unanimity of opinion and purpose, and the committee therefore recommends that immediate steps be taken by the Society to endorse the proposed schedule of salaries already approved by Engineering Council.

(e) Regarding the suggestion that the Society approve an increase equivalent to 40% in all grades of public service as a possible first step toward the attainment of its final schedule, the committee is of the opinion that there is nothing to be gained by such action at this time. The various budgets having in general been prepared and approved for the ensuing year, it will not be possible to effect any changes in existing allowances. Without knowledge of the conditions which will prevail when the new budgets are in process of preparation for the next year's salaries, it is very difficult to formulate an intelligent policy with respect to action of this sort. If the present unsatisfactory conditions continue to obtain in the public service, it is possible that relief will come automatically through the inability of public departments to obtain satisfactory engineering service except at substantial advances in salaries. Furthermore, it seems to the committee to be unwise to establish a standard of salaries as already recommended and immediately thereafter repudiate the schedule by offering to adjust temporarily upon a lower basis. Your committee is of the opinion, therefore, that no action should be taken on this suggestion at the present time

Respectfully submitted,

(Signed) FRANK A. BARBOUR.
HENRY F. BRYANT.
WALTER W. CLIFFORD.
BARZILLAI A. RICH.
CHARLES M. SPOFFORD.
JOHN P. WENTWORTH.
CHARLES R. GOW, *Chairman.*

APPLICATION FOR MEMBERSHIP.

[May 20, 1920.]

THE By-Laws provide that the Board of Government shall consider applications for membership with reference to the eligibility of each candidate for admission and shall determine the proper grade of membership to which he is entitled.

The Board must depend largely upon the members of the Society for the information which will enable it to arrive at a just conclusion. Every member is therefore urged to communi-

cate promptly any facts in relation to the personal character or professional reputation and experience of the candidates which will assist the Board in its consideration. Communications relating to applicants are considered by the Board as strictly confidential.

The fact that applicants give the names of certain members as reference does not necessarily mean that such members endorse the candidate.

The Board of Government will not consider applications until the expiration of twenty (20) days from the date given.

BROWN, OLIVER BLANCHFIELD, Watertown, Mass. (Age 19, b. Marblehead, Mass.) Educated in public school, graduate English High School, Boston, technical course, June, 1918. Draftsman with Stone & Webster, July, 1918, to Jan., 1919; draftsman Fay, Spofford & Thorndike from Feb., 1919, to present time. Refers to C. R. Berry, C. A. Farwell, F. H. Fay, R. W. Horne, E. D. Mortenson and W. F. Pike.

BROWN, WALTER IRVING, Boston, Mass. (Age 50, b. East Boston.) Educated in the public schools and took engineering course at Y. M. C. A. Rodman, City of Boston, 1895 to 1900; transitman with Metropolitan Sewerage Commission, in charge of party in construction work 1901 and 1902; transitman, City of Boston, Sewer Dept., in charge of party on construction work, 1903 to 1917; chief inspector of equipment, Quartermaster's Dept., Boston Army Supply Base, 1917 and 1918, and at present transitman in Sewer Dept., Boston, in charge of party on construction work. Refers to J. E. Carty, E. S. Dorr, C. R. Gow, G. W. Hamilton and E. F. Murphy.

BRYANT, GEORGE LEO, Boston, Mass. (Age 28, b. Boston, Mass.) With T. G. O'Connell, Boston, drafting and inspecting, Aug. 1914, to March, 1917; with E. B. Badger & Sons Co., drafting and inspecting, March, 1917, to Oct., 1918; with Peter Gray & Sons, Inc., as chief draftsman, Oct., 1918, to June, 1919; assistant plant engineer and draftsman, with Aberthaw Constr. Co., June, 1919, to date. Refers to J. A. Garrod, H. A. Gray, A. B. MacMillan, E. D. Mortenson and R. E. Parker.

BURLEIGH, WILLARD GILE, Waverley, Mass. (Age 26, b. Malden, Mass.) Elected a Junior, Nov. 17, 1915. Oct., 1915, to April, 1916, installing and inspecting thermostatic heating control devices; April, 1916, to Sept., 1917, drafting and compiling cost data for valuation purposes; Sept., 1917, to Aug., 1919, non-commissioned officer, Corps of Engineers. In charge of grading and track-laying parties for U. S. A. railroad yards at St. Nazaire. Instructor on Dorel process reproduction and plane table survey at Army Staff College, Langres; asst. in charge of drafting, map mounting and lithography, G-2-c, Third Corps; instructor in topographical drawing and liaison officer with the Section Topographique des l'Armes at Langres, Aug., 1919, to May, 1920, rated as computer, recording on building inventory, estimating for fire losses

and valuation purposes, and compiling insurance schedule, and at present transitman for Jackson & Moreland, Boston, on development projects. Refers to E. P. Bliss, N. C. Burrill, M. M. Cannon, J. B. Mailey, D. N. Peaslee and F. C. Shepherd.

CLARK, WILLIAM ALLEN, Boston, Mass. (Age 25, b. Winthrop, Mass.) Graduate Mass. Inst. of Technology, 1917, sanitary engineering course. With Mass. State Dept. of Health, July to Oct., 1917; captain Corps of Engineers, U. S. Army, Nov., 1917, to Feb., 1920; and with Lockwood, Greene & Co., since March, 1920. Refers to A. P. Porter, Dwight Porter, C. M. Spofford and H. C. Thomas.

CLEVERDON, HERBERT SQUIRES, Watertown, Mass. (Age 32, b. New York City.) Student in civil engineering course, New York University, 1905-06; graduate of Mass. Inst. of Technology with S.B. degree, 1910; asst. engineer with Shepley, Rutan & Coolidge, Boston, 1910-13; traveled with the American Inst. of Architects in Europe and Asia Minor in 1912; structural engineer, Turners Falls Power and Electric Co., on hydro-electric development, 1913-15; engineer for American Mutual Liability Insurance Co., 1915-17; 1st lieutenant Engineers, 104th Engineers, 1917-19, and since 1919 with Lockwood, Greene & Co., Boston. Refers to J. B. Babcock, 3d, J. E. Hanlon, G. F. Hobson, Dean Peabody and A. L. Shaw.

CRANDALL, JAMES STUART, Malden, Mass. (Age 29, b. Dartmouth, N. S.) Graduate University of Maine, in civil engineering, 1915. Entered the employ of the Crandall Engineering Co. as assistant engineer in office and field; for a short time with W. W. Wight, C.E., Wellesley, Mass.; with Crandall Engineering Co., assistant engineer, Jan., 1917; 2d lieutenant with the 25th, 29th and 74th Engineers, from May, 1917, to June, 1919, and since that time with the Crandall Engineering Co., consulting and contracting engineers on dry docks, East Boston, and now assistant to the president of their company. Refers to H. S. Boardman, R. W. Horne, J. P. Wentworth and C. W. Wood.

CROSS, RALPH UPTON, Worcester, Mass. (Age 28, b. Worcester, Mass.) Graduate Tufts College, in civil engineering, 1916; assistant to general manager, E. J. Cross Co., Worcester, general contractors, 1916-17; enlisted June, 1917, commissioned 2d lieutenant, Q.M.C., May 30, 1918, and assigned to construction division of the army as inspector, July, 1918; promoted to 1st lieutenant, Aug., 1918, and discharged, Jan. 15, 1918. At present and since discharge, with E. J. Cross Co., of Worcester, general contractors, as vice-president. Refers to A. W. French, S. H. Pitcher, E. H. Rockwell, F. B. Sanborn and J. A. Tosi.

EBERHARD, WALTER CARL, Belmont, Mass. (Age 28, b. Boston.) Graduate Mass. Inst. of Technology, in civil engineering, 1914; was assistant in department of civil engineering at the Inst. of Technology from July, 1914, to July, 1916; from July, 1916, to Sept., 1917, draftsman in valuation corps, Rutland Railroad; Oct., 1917, to April, 1918, with Stone & Webster Engineering Corps, as chief of party on railroad location and construction, Picatinny Arsenal, Dover, N. J.; in naval reserve force from April, 1918, to Jan., 1919, first as

inspector of naval aircraft, and then commissioned ensign; and Feb., 1919, to the present time instructor in drawing and descriptive geometry at the Mass. Inst. of Technology. Refers to J. B. Babcock, 3d, C. B. Breed, G. L. Hosmer, J. W. Howard and A. G. Robbins.

FOSTER, HOWARD LESLIE, Detroit, Mich. (Age 26, b. Merrimac, Mass.) From July to Sept., 1916, instructor in surveying at Mass. Inst. of Technology; Sept., 1916, to June, 1917, assistant in civil engineering at Inst. of Technology; June, 1917, to Feb., 1918, sales engineer with Witherow Steel Co., designing reinforced concrete structures and estimating steel; Feb. to Sept., 1918, instructor at U. S. A. School of Military Aëronautics at Inst. of Technology; Nov., 1918, to July, 1919, inspector and production manager with England Mfg. Co., Detroit, manufacturing shell punches; Aug., 1919, to April, 1920, structural engineer with Smith, Hinchman & Grylls, architects and engineers, Detroit, special designing and in charge of work, and April, 1920, to date, with Lockwood, Greene & Co., at Detroit office. Refers to C. B. Breed, G. L. Hosmer, L. J. Johnson and Dwight Porter.

KINSMAN, HAROLD LESLIE, Arlington, Mass. (Age 25, b. Cambridge, Mass.) Graduate Rindge Technical High School in 1915, and student in structural department of the Lowell Inst. of Industrial Foremen; Sept., 1916, to July, 1917, draftsman with Fay, Spofford & Thorndike; July, 1917, to April, 1919, with the 101st Engineers, U. S. Army; April, 1919, to date, draftsman with Fay, Spofford & Thorndike. Refers to C. R. Berry, R. W. Horne, E. D. Mortenson, W. F. Pike, B. A. Rich and K. C. Reynolds.

MORRILL, GEORGE PILLSBURY, Boston, Mass. (Age 46, b. Feeding Hills, Mass.) Member of American Society of Civil Engineers. Graduate civil engineering course at Yale University, 1897. From 1898 to 1901 rodman and transitman, city engineer's office, Springfield, Mass.; 1901 to 1909 in Philippine service as assistant engineer and second assistant city engineer of Manila, and resident engineer (1905-07) in charge of construction of masonry, dam, tunnels, pipe lines, roads, etc., for new Manila water works; 1907-14, in Cuba, designing and constructing water works, flood prevention works, roads, bridges, inspection, etc., for Cuba government; 1915, graduate work at Yale, and various small engagements including two months with Westinghouse, Church, Kerr Co., on construction of a powder factory for Ætna Explosive Co., at Drummondville, Quebec; Jan., 1916, to March, 1916, sales work; March, 1916, to Jan., 1920, supt. of construction with Raymond Concrete Pile Co., and Jan., 1920, to date, district manager of the Raymond Concrete Pile Co. Refers to Linton Hart, and is recommended by Messrs. Spofford, Thorndike and Tinkham of the Board of Government.

McSWEENEY, THOMAS FRANCIS, Framingham, Mass. (Age 27, b. Marlboro, Mass.) Graduate Mass. Inst. of Technology, 1916; foreman, Charles R. Gow Co., June to Sept., 1916; assistant superintendent Geo. A. Fuller Co., Sept., 1916, to March, 1917; with Fay, Spofford & Thorndike, March, 1917; construction manager, Concrete Steel Co., April, 1917, to March, 1918; engineer officer, U. S. A. T., March to Aug., 1918; structural engineer, U. S. S. B., E. F. C., concrete ship section, Aug., 1918, to Dec., 1919,

and since 1919, assistant engineer with the Turner Construction Co. Refers to C. R. Gow, E. F. Miller, Hugh Nawn, H. F. Sawtelle, C. M. Spofford and G. C. Whipple.

O'BRIEN, MARTIN J., Medford, Mass. (Age 26, b. Cambridge.) Graduate Lowell Industrial Foremen, M. I. T., 1915, and one year special course in reinforced concrete, 1916-17; with Lockwood, Greene & Co. from May, 1910, to present time, as draftsman and designer (steel and reinforced concrete), except eighteen months' service in the army, Oct., 1917, to May, 1919, as pilot, Air Service. Now with Lockwood, Greene & Co. Refers to L. B. Ellis, B. A. Rich, H. F. Sawtelle, P. W. Taylor and H. C. Thomas.

SCULLY, FRANCIS PAUL, Cambridge, Mass. (Age 26, b. Boston.) Graduate Mass. Inst. of Technology, 1915. Engaged in general contracting and building business, June, 1915, to Oct., 1917; lieutenant (j.g.) U. S. Navy, with Bureau of Steam Engineering, Div. of Aeronautics, Oct., 1917, to April, 1919; and from April, 1919, to date, secretary of The Scully Co., in engineering and construction work. Refers to W. F. Pike, G. E. Russell, H. C. Sheils, C. M. Spofford, H. C. Thomas and C. W. Wood.

SHAW, EDWARD WALTER, Newtonville, Mass. (Age 29, b. Worcester, Mass.) Graduate Worcester High School, 1909, and at Worcester Polytechnic Institute, 1909-11; from 1911 to 1916 with C. W. Fisher, architect, L. W. Briggs Co., architects, and Central Building Co., general contractors; Jan., 1916, to June, 1918, with Eastern Bridge & Structural Co., as head of light iron drafting force; June, 1918, to March, 1919, with the Aberthaw Construction Co. as draftsman; March, 1919, to Aug., 1919, squad chief, and Sept., 1919, to date, specification writer. Refers to S. E. Coburn, H. A. Gray, A. B. MacMillan, E. D. Mortenson and R. E. Parker.

THERIAULT, WILLIAM J., Cambridge, Mass. (Age 25, b. Meteghan, Digby Co., N. S.) Certificate from Wentworth Institute, 1920, architectural construction; general ship construction June, 1915, to Sept., 1917; with Nova Scotia Shipbuilding and Transportation Co., assistant superintendent of construction, Sept., 1917, to March, 1918; with Groton Iron Works, assistant superintendent of construction, March, 1918, to July, 1918; with Ship Construction and Trading Co., assistant master builder, July, 1918, to June, 1919, and since 1919 draftsman with the Aberthaw Construction Co. Refers to H. A. Gray, E. D. Mortenson, R. E. Parker and E. A. Varney.

WOOD, CARL WILBUR, Winchester, Mass. (Age 29, b. Velasco, Tex.) Educated at Malden High School and Mass. Inst. of Technology, class of 1915; in 1917 employed by Mass. Harbor and Land Commission, as rodman on survey of Mass. and Conn. boundary line; 1908-12 with the War Dept., Harbor and Land Office, New London, Conn., as rodman and instrumentman; 1913, with Mass. Harbor and Land Commission, survey of Merrimack River; 1914, with Maine Highway Commission as engineer in charge of road construction for one section; 1915-17 with Metropolitan Water Works as assistant engineer on construction of water-supply mains, etc., and 1917 to date with Stone & Webster as follows: 1917-18, resident engineer on construction of the Watertown arsenal, Camp Kelly Aviation Field, Pittsfield

Power House; 1918-20, assistant engineer on railroad, yard and ship construction, Hog Island; and 1920 assistant engineer, construction division, Boston office of Stone & Webster. Refers to W. E. Foss, J. W. Howard, W. F. Pike, H. C. Thomas, D. M. Wood and H. B. Wood.

LIST OF MEMBERS.

ADDITIONS.

COLEMAN, GEORGE S.	15 Marmion St., Jamaica Plain, Mass.
ELLIS, RICHARD H.	North Andover, Mass.
MALOY, WALTER A.	24 Duke St., Mattapan, Mass.
MOULTON, J. WENDELL,	23 Capitol St., Augusta, Me.
PARKER, EDWIN S.	117 Davis Ave., Brookline, Mass.
REYNOLDS, KENNETH C.	231 Morrison Ave., W. Somerville, Mass.
TURNER, HOWARD M.	70 State St., Boston, Mass.
WALKER, EDWARD L.	44 Union Ave., Framingham, Mass.
YOUNG, ERNEST M.	15 Oakland St., Brighton, Mass.

CHANGES OF ADDRESS.

ALLEN, C. S.	25 Duffield Road, Auburndale 66, Mass.
BABBITT, J. H.	Engrg. Dept., The Miller Rubber Co., Akron, Ohio.
BIGELOW, W. W.	c/o Lockwood, Greene & Co., 245 State St., Boston, Mass.
BROWN, W. M.	128 Market St., Room 510, Newark, N. J.
CARTER, H. H.	99 Chauncy St., Room 409, Boston, Mass.
COREY, K. T.	16 Ventura St., Springfield, Mass.
CUTTING, G. W., Jr.	50 Newton St., Auburndale 66, Mass.
DICKSON, A. D.	949 Washington St., Newtonville, Mass.
EWING, W. C., Campaign Director,	American City Bureau, New York, N. Y.
FELTON, B. R.	68 Waban Hill Rd. North, Chestnut Hill, Mass.
FOSTER, H. L.	122 Spokane Ave. W., Detroit, Mich.
GAGE, E. H.	Care U. S. Public Health Service, Custom House, Norfolk, Va.
HART, LINTON.	80 Boylston St., Boston 11, Mass.
HAYES, H. W.	163 State House, Boston 9, Mass.
KLINK, N. S.	314 Faneuil St., Brighton 35, Mass.
McCONNELL, I. W.	125 East 46th St., New York, N. Y.
MORPHY, L. G.	56 Nottingham Rd., Brighton, Mass.
MORSE, C. F.	P. O. Box 877, Southampton, N. Y.
REED, C. B.	1658 Holywood Road, Cleveland, Ohio
TUCKER, L. W., Care Dwight P. Robinson Co.,	290 Arch St., Freeport, N. Y.
WEBB, D. C.	Naval War College, Newport, R. I.
WOOD, H. B.	218 Commonwealth Pier, Boston, Mass.

DEATH.

BALDWIN, LOAMMI F.	May 9, 1920.
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PERSONAL NOTE.

MR. LUIS G. MORPHY, of 56 Nottingham Road, Brighton, Mass., has resigned as principal assistant engineer of the Boston & Albany Railroad, to take a position with The Foundation Company of New York City as its representative in South America, and will terminate his services with the Boston & Albany on May 1. Mr. Morphy was born in Orizaba, Mexico, December 4, 1876, and came to America as a young man, graduating in 1900 from the Rensselaer Polytechnic Institute, at Troy, N. Y. Immediately after, he went into the employ of the New York Central Railroad at Albany, N. Y., in the engineering department. After serving in Buffalo, N. Y., and New York City, he came to Boston in October of 1907 as assistant engineer of maintenance of way and construction. He has been successively promoted to assistant to the chief engineer, designing engineer, division engineer and principal assistant engineer on the Boston & Albany. Mr. Morphy is a member of the American Railway Engineering Association, is president of the Boston Chapter of the American Association of Engineers, is a member of the Executive Committee of the New England Railroad Club, is a member of the Boston Society of Civil Engineers, the New York Railroad Club and other organizations.

He will sail on May 5 from New York City for Lima, Peru, and La Paz, Bolivia, and other important points in South America.

LIBRARY NOTES.**RECENT ADDITIONS TO THE LIBRARY.****U. S. Government Reports.**

Annual Report of the Interstate Commerce Commission for 1919.

Report of the Librarian of Congress for 1919.

Municipal Statistics for Cities for 1918.

Report of the International Boundary Commission for 1918.

Alaska Magnetic Tables and Magnetic Charts for 1920.

State Reports.

New York. Report of the State Engineer and Surveyor. Vols. 1 and 2, for 1918.

New Jersey. Annual Report of State Department of Health for 1919.

Connecticut. Annual Report of the Public Utilities Commission, 1919.

Rhode Island. Annual Report of the Public Utilities Commission, 1918.

Massachusetts. Annual Report of the Commission on Waterways and Public Lands, 1918.

Massachusetts. Annual Report of the Homestead Commission, 1918.

Municipal Reports.

Chelsea, Mass. Annual Report of the Water Commissioner for 1919.

Burlington, Vt. Annual Report of the Water Department for 1919.

Providence, R. I. Annual Report of the Water Supply Board, 1919.

New Bedford, Mass. Report of the Water Board for 1919.

Northampton, Mass. Annual Report of the Water Commissioners, 1919.

Newton, Mass. Annual Report of the Street Commissioner, 1919.

Wellesley, Mass. Annual Report of the Water and Municipal Light Commissioners, 1919.

Haverhill, Mass. Annual Report of the Board of Water Commissioners, 1919.

Cambridge, Mass. Annual Report of the City Engineer for 1918.

Dover, N. H. Annual Report of the Board of Water Commissioners for 1919.

Miscellaneous.

A New Method of Sewage Disposal. Sidney P. Armsby.

Test Data on Lime in Concrete and Mortar. Tyrrell B. Shertzer.

Effect of Fineness of Cement. Duff A. Abrams.

Condensed Diagrams of the Inspection of the B. & A. R. R.,
1897. P. H. Dudley.

LIBRARY COMMITTEE.

BOSTON SOCIETY OF CIVIL ENGINEERSFOUNDED 1848

PAPERS AND DISCUSSIONS

This Society is not responsible for any statement made or opinion expressed in its publications

ADDRESS AT THE ANNUAL MEETING.

BY LEONARD METCALF, PRESIDENT BOSTON SOCIETY OF CIVIL ENGINEERS

(March 17, 1920.)

CONSTRUCTIVE EFFORT VERSUS DESTRUCTIVE CRITICISM AND
INACTIVITY IN PROFESSIONAL SOCIETIES.

IN laying down my duties as president of this fine old organization, I want to express to you the interest and pleasure which I have found in this office and my deep obligation to the Secretary and other members of the Board of Government and to many members of the Society, particularly the younger men, for their active support and assistance. I have felt keenly the responsibility of the position, as I have known personally many in the long line of competent engineers and administrators who have preceded me; but good team play and unity of purpose have made for very friendly relations on the Board and satisfaction in its work. So you will perhaps bear with me if I take the liberty of discussing with you briefly the problem of unrest in our engineering societies and of suggesting its solution through a revitalized conception of possible lines of service to their members.

General Unrest.

Never has there been greater need of open minds to review old traditions and principles, the soundness of which have been demonstrated by time, to promptly and intelligently readjust them to the rapidly changing conditions and to raise new

standards that shall command confidence and bring unity of purpose and action.

I am cognizant of the general spirit of unrest which exists all over the country, no less among engineers than others, for I have met it within the past two years from the East to the far West and from the North to the extreme South of this country. The grievances are real, for the present burdens are heavy and many injustices need to be righted, as you all know. They have crystallized, for example, in the reports of the development committees of many societies, in that of the Joint Conference Committee of the four National Engineering Founder Societies; in the work of Engineering Council and report of its Committee upon the Compensation of Engineers; in the well-considered report of our own Committee on Compensation of Engineers; in a number of admirable articles from the pen of that veteran editor, Mr. Charles Whiting Baker; in the formation of a rapidly growing new society, making welfare work for engineers its primary object, and even of labor unions composed of engineers affiliated with organized labor groups.

Engineers Unskilled Salesmen of Their Labor.

Engineers have not yet learned to fairly appraise their services and to sell them profitably. In the gigantic task of the national preparation for war, engineers have been self-sacrificing to the point of impoverishment. In the public service and in many cases of private service their inadequate salaries have stood practically still during the war period, where the wages of other labor have doubled and trebled and more. Brains have been at a financial discount; brawn, better organized, has fared better.

Now, with the return of peace, the struggle for existence has been intensified. Civil engineers employed upon the construction and maintenance work of the railroads of this country have received lower compensation than have engine drivers, brakemen and clerks. Many designers in our shipyards have received smaller compensation than the carpenters and mechanics. The laborer who works with his hands has been better paid often than the man who worked with his head. Day

laborers have drawn higher pay during many months than the foreman directing their work. There is no justification, in fact or in productivity, for this condition.

Meanwhile, the purchasing power of our incomes has been nearly halved, or costs have been doubled. This condition must and will pass, though unhappily lack of effective coöperation and of past experience in meeting such situations are likely to delay the transition; but the world recognizes to-day, far better than it did before the war, the character, breadth and scope of the work of the engineer and its dependence upon it.

In public works and public utility service the engineers have too long undervalued their professional service and been content to attach too great weight to continuity of service and long tenure of office.

The constant tendency toward the building up of political machines in our cities has militated against fair treatment of the engineer, to whom, with rare exception, politics are distasteful.

So, too, the development and growth in power of large construction concerns, many of them handling not only the scientific and physical but also the financial elements of their problems, while giving greater opportunity and return to the engineer of exceptional talent, resourcefulness and administrative ability, sometimes tend toward the exploitation of the services of the engineer and make the outlook of the engineering staff as a whole less attractive financially and more keenly competitive. To the man above the median line the outlook is probably much better to-day than ever before; to him below the line, perhaps, worse, certainly but little improved. But the median line is higher and standards of work are constantly being bettered, advance in compensation following of necessity, though often slowly.

Some Causes of Lack of Active Interest in Our Engineering Societies.

As I have attended engineering society meetings in different parts of the country, often when but a handful of men were present to hear a paper prepared with care and labor by some fellow-member, I have asked myself, "What is responsible for the failure of the men to turn out in larger numbers? Where are the younger men?"

Some of the causes are obviously the diversification of interests, specialization, improvement in means of communication, the smaller consumption of time involved in reading or skimming an article instead of listening to its presentation, and perhaps, most important of all, the multiplicity of demands upon our available time.

It is to be remembered too that engineering as a science is young, scarcely half a century old. Many of the pioneers in our profession are happily still with us. The need for coöperation of engineers in such societies was more urgently felt in those early days of the formative period than to-day, because of the lack of precedent, record and knowledge. But the societies themselves have constantly grown in power.

Now comes a new generation of engineers, prepared by the technical schools, instead of by hard experience, able to find good precedent, well-classified knowledge and epitomized statement of the state of the art in many fields of engineering; more sophisticated, but less keen for discovery until competitive struggle challenges courage and awakens ambition. Then real progress begins and knowledge takes on new significance, new value, as it has from generation to generation, to the young man.

The Present Problem of Engineering Societies.

The present problem of engineering societies is that of rousing the younger men to help themselves, of bringing home to them what they will otherwise learn regrettably late, that the engineering societies offer the open door to acquaintance and happy relationships with men of their own profession, to friendly service and effective coöperation, to the development of winsome personality and broader life.

While it is the younger men who suffer from failure to justly appraise the situation, we older men must bring home to them, as would father to son, these obvious facts, clear to us because of our broader experience with life. Many of the younger men do not appreciate these facts. They find it exceedingly difficult to overcome their shyness and to mingle with men to whom they have not previously been introduced. They naturally shrink from putting themselves forward and from making the first

advance, even where they are ready to go more than half way in the effort to meet men. The Society must find a way to overcome this difficulty, for the feeling is a natural one and widespread. It is recommended, therefore, that there be present at every meeting members of the Committee on Activities, conspicuously labeled, who shall act as welcoming hosts and introduce new members to one another, and see to it that no man can feel himself out of the circle or of common touch. Many organizations, like the Chambers of Commerce and Rotary clubs, have recognized this need as a vital one and have succeeded in overcoming the difficulty, supplanting shrinking diffidence with warm-hearted good-fellowship.

It is important, too, that the coming generation of engineers should not lose the advantage already gained in our generation, of the maintenance of friendly relations with one another, even though in active competition. Distinguished foreign engineers, who have visited us, have repeatedly spoken of the marked contrast in this respect, between conditions in the United States and abroad, and of the greater advantage of the cordial relations here existing. We should broaden and strengthen these ties, and make them more helpful.

How can this be done?

Labor Unions Not the Solution.

The fields of the professional society and the labor union are similar to a limited degree only, quite distinct in many respects. The labor union interests itself primarily in the material welfare of its members, — the wages, hours of employment, conditions of work and similar questions. Its success depends upon its power; its power upon its members; its membership upon the breadth of its aims and simplicity of requirements for admission. As mere numbers largely determine its strength, the selective process cannot be carried far in limiting admission to its brotherhood.

The professional society, on the other hand, may advantageously carry the selective process much further, and practical experience has demonstrated that with the development of the state of the art, the process of specialization leads to the

formation of new societies and associations of men highly skilled in narrower fields. While the professional society may establish codes of ethics, general scales of compensation and other measures helpful to the material welfare of the engineer, its primary function must ever be to broaden technical knowledge, to improve engineering methods and standards and to give facilities for the advantageous interchange of professional knowledge, technique and opinions.

The labor union exercises its influence through organized force or economic pressure; the professional society rather through improvement in methods, efficiency and in standards of practice. The means used for accomplishing betterment are in marked conflict in principle and application. There is little hope of their unification. The best that can be looked for is the maintenance of such relations between the engineer's labor union and his professional society that the young engineer who joins the labor union may not be denied entrance to the engineering society at a later date, when his professional spirit has grown and developed and he can discriminate intelligently between the two fields of activity.

Welfare Societies Fill a Limited Field.

While there is room at the present for effective welfare work by strong organizations formed for this primary object, it is not likely to prove possible to carry on collaterally effective work of equal importance in the engineering field. The independent altruistic spirit may go hand in hand with individual effort, commanding public confidence and respect, but question of possible selfish ulterior motive immediately arises, when altruistic spirit attempts to emerge from the spirit of selfish welfare work.

All experience has shown that the most helpful and enduring field of work for the engineering societies must be the educational and professional rather than the personal.

While no doubt organizations devoted to welfare work may build up good reputations for fair consideration of the public interest, as well as that of its members, just as in the field of organized labor certain organizations have the reputation of

being better officered and managed than others and of having scrupulous rather than unscrupulous regard for contractual relations, the building up of the prestige of engineering societies is a much more difficult task. It requires a nice discrimination between feasible and impossible action, between productive and non-productive fields, between desirable publicity and danger of exploitation, and a clear conception of the difference between progressivism and radicalism.

It is particularly important at this time that we should build on the past, safely and wisely, shaping our societies to meet present problems the better, rather than to throw experience of the past to the winds and to embrace supposedly new ideas, often idealistic and attractive in principle, but impracticable of enforcement and therefore visionary.

Interesting the Younger Men to Meet Informally and Discuss Their Problems.

One of the most promising lines of work lies in efforts to bring together effectively in this Society the young engineers of different offices in this city and neighborhood, interested in special problems of design. These meetings should tend to broaden acquaintanceship, stimulate interest and give opportunity for really effective educational work. During the past year this movement was instituted, and three such meetings have been held at which there were presented and discussed some interesting recent problems in foundations for structures on the water front. From thirty-five to fifty of the younger men of the Society attended each of these meetings, and a lively and helpful discussion has resulted. The interest aroused and the response of the younger men have been most friendly and encouraging. Their comment has been favorable and appreciative.

The meetings can probably be made more helpful and the diffidence of the younger men in speaking be better overcome, by limiting the attendance to the younger men with but two or three of the older men, particularly experienced in the subject matter under consideration, present to assist in broadening and drawing out friendly discussion and comparison of ideas.

The discussions can be vitalized by taking up specific actual

problems recently faced by these young engineers in their daily work, with which they are therefore so thoroughly familiar that they can speak upon them informally without effort. Additional meetings can then be held, to broaden the examples of the application of the theories involved. Oral presentations are to be encouraged, rather than written ones.

In this way groups of capable young engineers can be drawn together and activity of interest in the work of the main society be gradually but materially stimulated.

Recent experience indicates further that it would be advantageous either to form a new section of the Society for this purpose, or to appoint a committee largely composed of the more active of the younger and middle-aged men of the Society, interested in this work, with perhaps two of the older men on the committee, who are in sympathy with the movement and whose greater acquaintance and experience would contribute to the breadth and sustained interest in this work.

Effort should be made to bring the older men into friendly touch with the younger men in every way possible and to the advantage of both.

Experience Talks.

Past-President Gow has made a very sensible suggestion that appears worthy of adoption,—that meetings also be held during the course of the year in which some of the more experienced men be asked to give practical talks upon some phases of their engineering experience, their failures and successes, arranging to have others join in the discussion at the same time, to broaden its scope, and using every effort to draw out the younger men. This, too, would tend gradually to bring the younger men into closer touch with the Society, through the informality of the procedure and their interest in such practical matters.

Use of Portion of Income of Permanent Fund for Social Activities.

In view of the rapid advance in cost of living, and consequent inadequacy of current funds, it appears reasonable to use a portion of the income of the permanent fund for social activities, which may bring men into closer touch with one another in ad-

vance of and after the regular meetings. Unless this is done, either the activities of the Society must be curtailed or the dues raised. Action has been taken along this line, by authorizing the Board of Government to make use of the current income of the fund during the year 1919-20. The present as well as the future generation of engineers may justly benefit by these funds.

Student Sections.

It appears desirable to consider further the formation of student sections, either of the Boston Society of Civil Engineers, or perhaps, better, of the national engineering societies, that they may act as natural feeders to these societies and bring home to the student engineer, at as early a date as possible, the advantage that will accrue to him from associating himself with the activities of some engineering society. The appointment of a committee to investigate and report upon this subject may be advisable, although it appears likely that action could more wisely be deferred until the national societies take action upon this subject.

Joint Society Meetings.

Joint meetings with the members of other engineering societies should be encouraged. They tend to broaden interest and acquaintanceship.

Proposed Association of Professional Technical Societies.

A movement has been initiated this year, by this Society, to investigate the desirability of bringing together in some form of association the existing professional engineering societies of this city and vicinity, with a view to drawing engineers of different kinds together, making more effective their organizations and decreasing the financial burdens involved by them. Prof. George F. Swain was appointed chairman of this committee, and report upon the subject is looked for within the next few months. Similar movements have been undertaken and proven advantageous in Chicago, Philadelphia and elsewhere.

Public Service and Welfare Problems.

There appears to be a growing belief on the part of engineers that their engineering societies should take a more active part in the discussion of public matters upon which the engineer is experienced and competent to advise the public. It is to be borne in mind, however, that such work must of necessity be of slow development if the work is to be made effective, owing to the very large amount of time and expense involved, and to the fact that the engineer has relatively little time and money to give to it. A good example of such work, as ambitious in character as it is desirable of accomplishment, is the present effort of engineers, architects, chemists, contractors and others, to bring about the establishment of a National Department of Public Works. Much self-sacrificing and excellent work has been done, and the present outlook for action by Congress is favorable, but it is to be clearly borne in mind that there is grave difficulty in maintaining concerted and effective effort of this sort over long periods of time, and that this movement has had very great financial obstacles to overcome.

Individual Efforts.

It is not to be supposed that the older men are alone responsible for the upbuilding of our engineering societies. This responsibility is shared alike by the younger men. Nevertheless, it is true that the former realize more clearly, as a result of longer experience, the importance to engineers, of active engineering societies, and it is therefore incumbent upon them to bring home this fact to the younger men, that valuable time may not be lost, and that the younger men may not wake up later to a realizing sense of what they have lost in failing to take active part in constructive efforts in this field during their early professional lives.

It is to be clearly remembered that the Society and we, as individuals, benefit only as we put effort into its meetings. Who has not felt the difference between friendly interest and of aloofness and cold criticism at meetings of one kind and another? How are conditions of the whole to be bettered if the individuals

sit by and fail or refuse to act? How often the flood gates of animated discussion have been opened by the courage of one man in asking a question or two, — perhaps a foolish question in the eyes of some. If members would all look at the matter from the point of view of the interest of the Society rather than of their personal feelings, what progress could be made! What vitalizes an organization? What, in the slang of the day, gives it "pep"? The enthusiasm of a few live men and the participation of large numbers of its members in its activities, — participation, I say, and not absorption. Participation involves giving out as well as taking in. Don't be clams, but, like the bee, spread the pollen while you sip the honey, and later share the honey with others.

It is with our societies as with our government. Congressman Dies of Texas, in retiring recently from the House of Representatives after ten years of service, pertinently said upon this subject:

"I wish the farmers of this country and the taxpayers of our land might have a return of the old democratic and republican theory that government is not created to support the people but that it is a creature to be supported by the people.

"The great mistake we are making, my friends, here now, is that we are practicing hypocrisy upon the people. We are leading them to believe that the government can support them and lift them by their boot straps out of their financial difficulties, when, as honest men, we should say to them that all that the government can do is to protect their life and their liberty and tax them to support the government.

"You have taken the fairest and best government ever known among men and you are making it into the most despicable socialism. You took the American people at a time when they believed they could support themselves and their government, and you are teaching them hour by hour and day by day to expect that their government shall support them. . . . It is their duty to support the government, and not the government's duty to support them."

We may well take these words to heart.

Your officers are ready to serve for you, to work for your best interests. They welcome help and criticism. But the criticism must be constructive, not destructive; must be fair

and candid; and you must be ready to do your share in advancing the interests of the Society and the standing of the engineer. Concerted coöperative effort is essential, and I appeal to the younger men of the Society, particularly, to attend the meetings, to join in the discussions, to suggest topics of interest to make our Society a live, vital force.

Show your officers how to make this good old organization a more useful and efficient one. It needs young blood with wit to observe cause and effect and to do straight thinking to the very end. So lend a hand!

BOSTON SOCIETY OF CIVIL ENGINEERS
FOUNDED 1848

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DISCUSSION OF SMALL SEWAGE PUMPING STATIONS.

By THORNDIKE SAVILLE,* MEMBER BOSTON SOCIETY OF CIVIL ENGINEERS.

MR. LEGER'S paper is an interesting and valuable contribution to a subject which is rather scantily treated in the literature of sewage disposal. It is doubtless due in part to this lack of information concerning the various types of small sewage pumping equipment that has led to the installation in some instances of elaborate devices for the removal of sewage where some of the simpler methods described in this paper would have been less expensive and more satisfactory in operation.

The writer had occasion during 1918 to recommend a method of sewage pumping for the large experimental aeronautical station at Langley Field, Va. This is an elaborately planned permanent field, where the sewage disposal problem was complicated by the fact that the average elevation of the surface of the ground was about six feet above sea level. All permanent houses had toilets or laundries in the basement, and it was impossible to discharge the sewage by gravity into Back River, which adjoins the field. The system finally adopted was to divide the field into two sections for sewage disposal, each section draining into a receiving station from which the sewage was pumped to a disposal plant serving both sections. The general plan of the sewerage system is shown in Fig. 1. In general, there was a strictly domestic sewage to care for, and

* Associate Professor, Hydraulic and Sanitary Engineering, University of North Carolina, Chapel Hill, N. C.

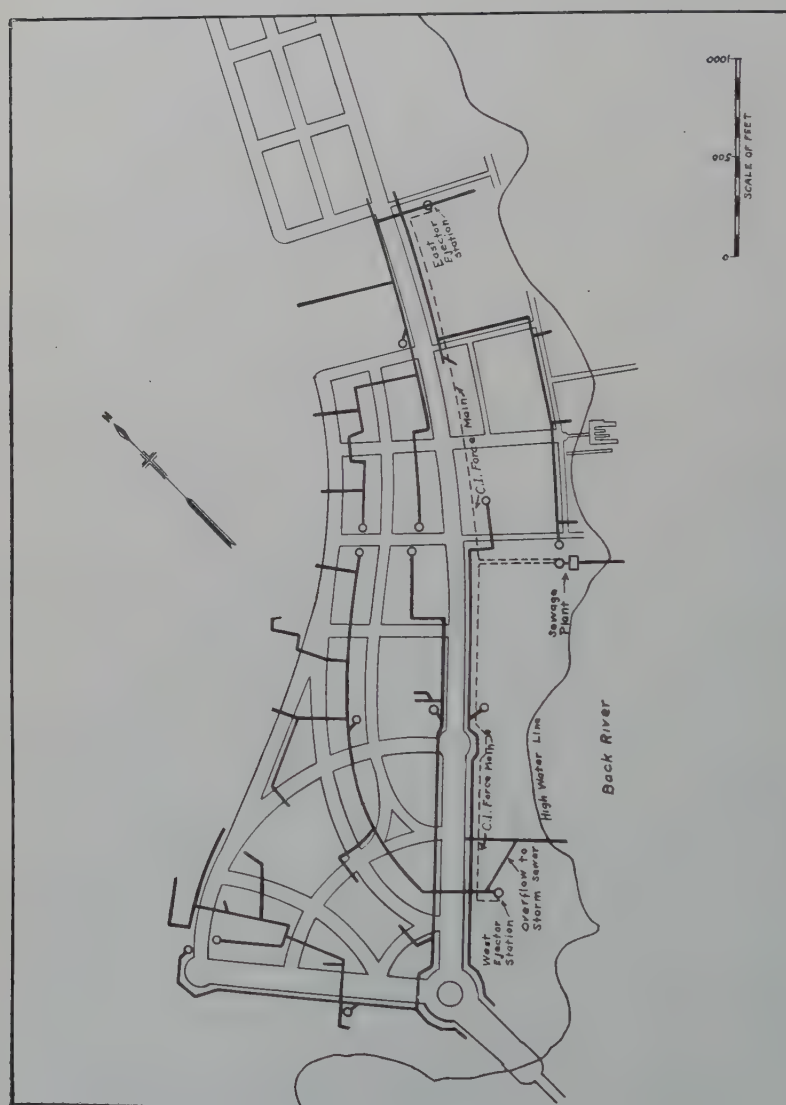


FIG. I.—SEWERAGE SYSTEM, LANGLEY FIELD, VA.

most of the system consisted of 6-in. pipe laid on a grade of 0.4 ft. per 100 ft., with flush tanks at the ends of all branches and at certain intermediate points. The roads are of concrete, and all road crossings were laid with 6-in. or 8-in. cast-iron pipe. As the various branch lines came together the size of the pipe was increased to 8 in. and 10 in.

The question arose as to the best method of pumping the sewage from the two receiving stations. After a very careful study and inspection of several municipal plants, it was decided to install sewage ejectors of the Shone type. In this particular case, however, a complication arose from the fact that the sewage was to be pumped to a disposal plant consisting of an Imhoff tank and filters. It was thought that the sudden discharge of large quantities of sewage over short periods of time, due to the intermittent operation of the ejectors, might interfere with the proper operation of the Imhoff tank. One method of reducing this rush of sewage was embodied in the Imhoff tank, which was designed by Ford Kurtz, of the J. G. White Corporation. This was to introduce scroll passages at the inlet to the tank, which reduced considerably the velocity of the entering sewage. This has been described in detail in another article.*

A further regulation was suggested by the writer to cause a more constant flow from the ejectors. Ordinarily an ejector installation comprises two units, one of which is held in reserve. It was thought that it might be possible to utilize both units, arranging them to operate alternately. In this way one unit would be filling while the other was discharging, and, if the flow of sewage was sufficient, an almost continuous discharge would pass through the force mains. In addition this would eliminate any backing up of sewage in the mains with consequent possible deposition, since the flow would be by-passed to the other ejector while one was discharging. With the coöperation of Mr. Kurtz and Mr. Yoemans (of the Yoemans Company, who manufacture the Shone ejectors), an alternating valve was devised in the air-supply system, such that the ejectors operated alternately, as described above.

* "Sewage Disposal at Langley Field," by Thorndike Saville and C. L. Weir, *Engineering News-Record*, August 21, 1919.

[Fig. 2 shows the double unit (the East) in a concrete pit 20 ft. below the surface, with an inlet from two directions.] Fig. 3 shows a near view of the West unit. Each pot is of 150 gal. capacity, and the alternating valve is installed. The valve

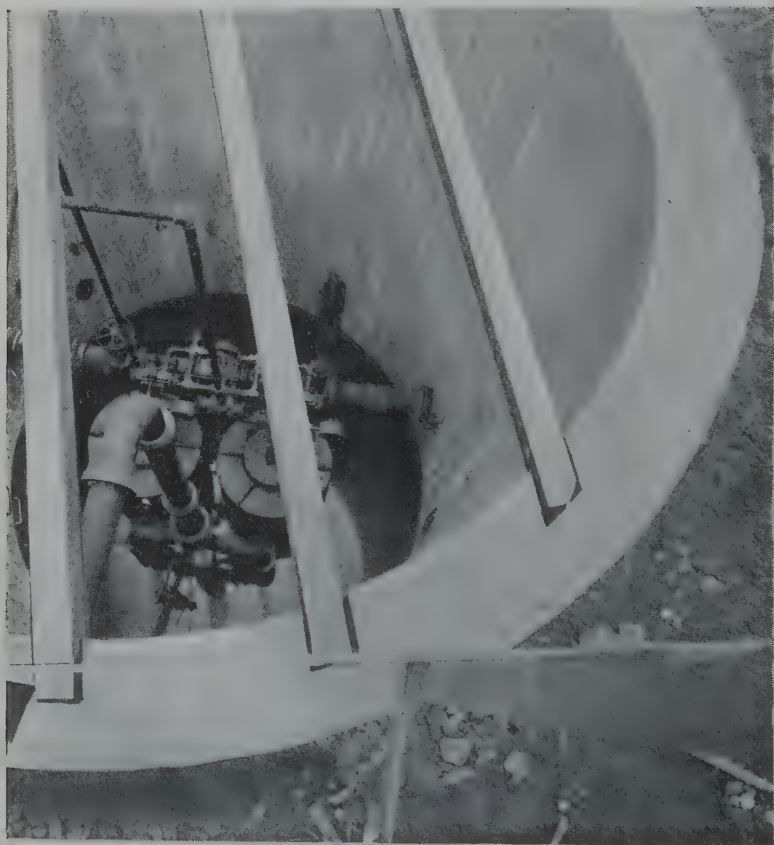


FIG. 2.—SEWAGE EJECTOR (EAST), LANGLEY FIELD, VA.

worked entirely satisfactorily under the most adverse conditions. For a short time, when one of the pits was flooded, the ejector worked under 5 ft. of water. When inspected by the writer last December, after more than a year of operation,

both stations were still serving the purpose for which designed. The valve is so arranged that it can be cut out of action in case of trouble with either ejectors, and the remaining ejector operated in accordance with the usual practice.

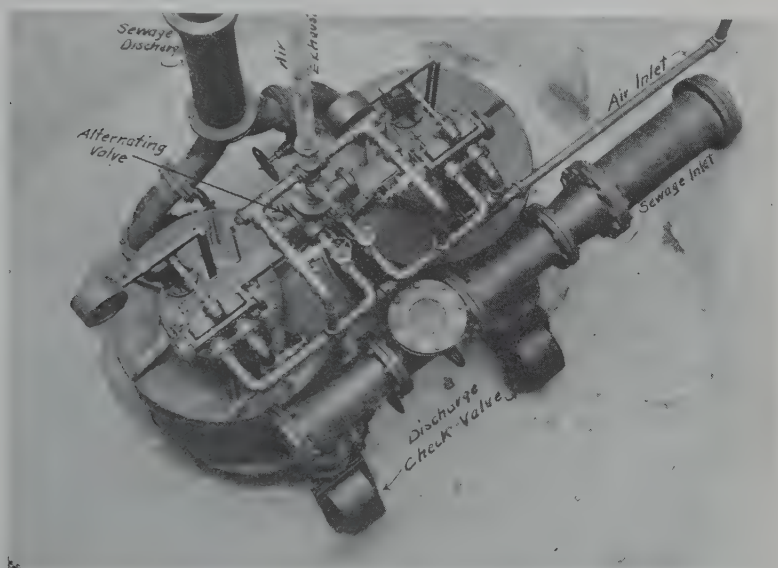


FIG. 3.—SEWAGE EJECTOR (WEST), LANGLEY FIELD, VA.

The general design of the sewerage system was made by Albert Crane and Ford Kurtz, of the J. G. White Corporation. This was subsequently somewhat modified, and the system constructed under the direction of the writer. Capt. J. McInerney was in general charge of construction of the field, and Col. Wm. L. Patterson was commanding officer.

MEMOIR OF DECEASED MEMBER.**EDWARD A. BUSS.***

MR. EDWARD A. BUSS was born in Peterboro, N. H., May 11, 1856, and died August 18, 1918, at the Homœopathic Hospital, Boston, following an operation, which was successful, but his physical strength, being largely impaired by a nervous attack a year previous, was not sufficient to withstand the shock.

He was the son of George W. and Lyrenea Jaquith Buss. The family moved to Boston when he was quite young. He received his early training at the Boston English High School, graduating in 1872. Later he was a special student at the Massachusetts Institute of Technology, where he was a member of the Class of 1876 for two years, and took a course of training in civil engineering which fitted him for his special line of work. On December 17, 1879, he was married to Mary Cobb Haskell, the only child of Capt. Charles and Mary Black Haskell, whose home was in Auburndale, Mass. Mr. and Mrs. Buss made their home at Hyde Park, and later at Winthrop, Mass.

In 1883, he established a private office of his own as a consulting engineer at 85 Water Street, where, for over thirty-five years, he maintained a useful and successful practice until his death.

He was employed in a consulting capacity by many large manufacturing concerns and interested himself in many large enterprises. For many years he was the consulting engineer for the Great Falls Manufacturing Company of Somersworth, N. H., and did a large amount of work for the Harmony Mills, the Hollingsworth & Whiting Company, the Cranes Paper Mills of Pittsfield, Dwinell and Wright Companies, the Boston Rubber Shoe Company, the Chicopee Water Works and many other large companies.

* Memoir prepared by Henry B. Wood, Edward S. Smilie and Edward P. Adams.

He conducted a model office, and his filing system for periodical engineering literature was thorough and unique. Each number, as received, was separated and so marked and filed by subjects for easy reference that not only was each indexed subject in a folder by itself for easy removal, but any number of each periodical could be reassembled at a moment's notice by his efficient stenographer. The use of this fund of engineering information he generously offered his engineering friends.

In his work he was always painstaking and thorough, more than ordinarily careful as to detail; always the student, he weighed carefully all the factors that entered into each problem and was then able to form an opinion all the more trustworthy because his line of reasoning was well seasoned with common-sense.

Being kindly disposed and always charitable, he was helpful to a large number of people, and, while the principal part of his time was given over to mill construction and extension of large manufacturing establishments, he found an opportunity to devote a large part of his time to public charities. Among others, he became interested in the Morgan Memorial. Its superintendent relates that having occasion to seek technical advice concerning the realization of their water power at South Athol, Mass., he naturally laid the matter before Mr. Buss on account of his kindly interest in the work.

His visit to the factory, the multitude of questions asked, his careful measurements of the stream flow, his insistence that absolute accuracy be obtained through the employment of some reliable surveyor and engineer, and the completeness of his report led the superintendent to express the wish that the "whole institution might be as thoroughly surveyed and studied," although he had no money to pay for such study. Mr. Buss replied, "I will make you that contribution if you think it worth while."

As a result of his investigation, many valuable aids to efficient management were suggested and adopted. A pamphlet was prepared by him and published by the Memorial, giving a complete history of the movement, detailed statements of its name and the scope of instrumentalities employed. Each topic

was arranged in unique and logical sequence, showing to the world that "as a Religious-Charitable Institution it meets the needs of to-day in the light of to-morrow." The Memorial also received the benefit of his financial support. Later he was invited to Brooklyn, N. Y., where the Good-Will Industries were organized along similar lines to the work of the Morgan Memorial, and his interest in this work continued for a long time after its inception.

On September 17, 1902, he became a member of the Boston Society of Civil Engineers.

Of a quiet and retiring nature, he did not form as wide an acquaintance among engineers as some enjoy; but those who knew him best feel that they have lost a good and true associate, whose noble and philanthropic work of these many years stands as a fitting testimony to his loyal devotion to the welfare and best interests of humanity in its broadest sense.



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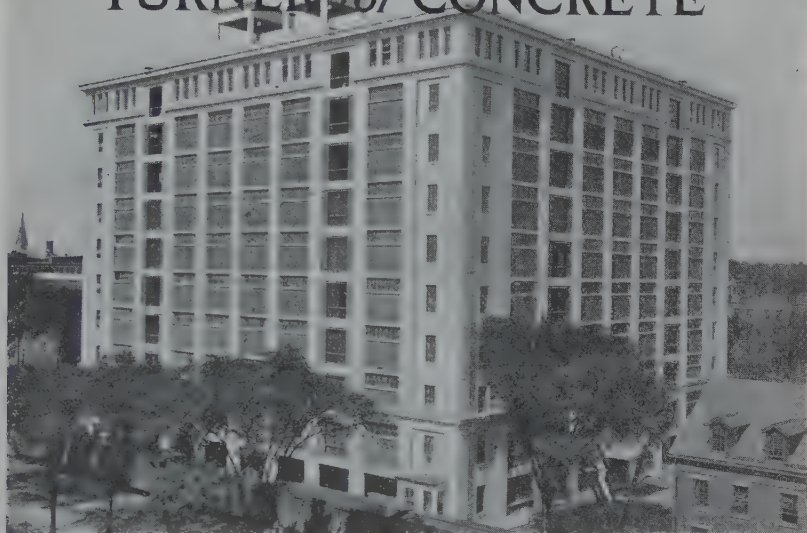
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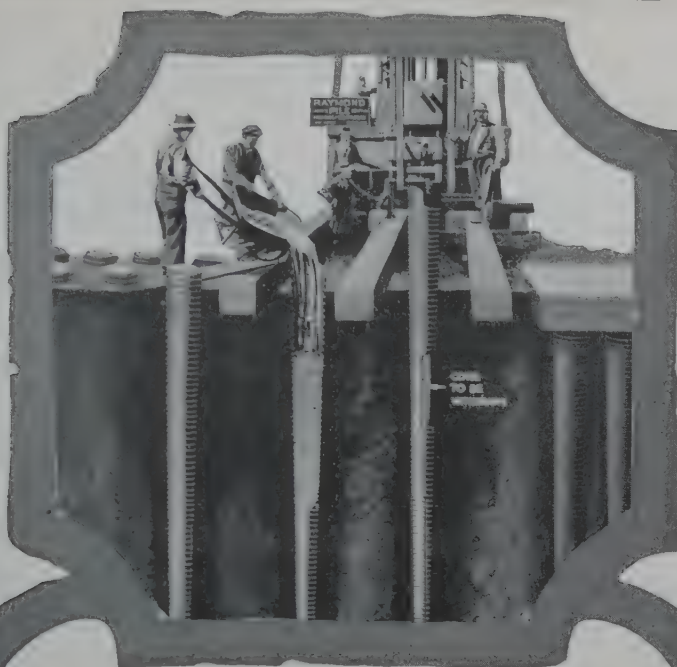
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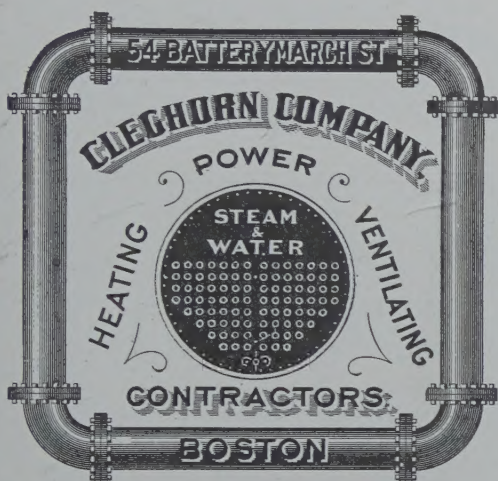
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